September 13, 2000

Commission's Secretary,
Magalie Roman Salas,
Office of the Secretary,
Federal Communications Commission,
445 12th Street, S.W.,
TW-A325,
Washington, D.C. 20554

Re: Docket No. 98-153

Dear Mrs Salas

Notice of Proposed Rulemaking: Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems

Please find below our Reply Comments in this matter.

Yours sincerely

Dr G K A Oswald
Associate Director, Arthur D. Little, Inc.

Mrs Magalie Roman Salas
Commission's Secretary
Federal Communications Commission

Arthur D. Little, Inc. has read the Commission's Notice of Proposed Rule Making regarding a possible revision of Part 15 with respect to Ultra-Wideband Transmission Systems, and many of the comments and further testing proposals.

In the main we agree that the changes proposed are appropriate. They represent a measured step in permitting a significant expansion of activity, with a low expectation of interference, while reserving the opportunity for further expansion as applications of these techniques, and knowledge of their interactions with existing systems, grow.

It is clear that a debate is growing concerning the use of UWB systems whose spectrum overlaps with the GPS band.

We have read the tests proposed by Stanford University, and the comments by Time Domain.

We agree that to be able to define a relation of equivalence between a UWB system, with all its defining parameters, and a simple broadband noise source would be most desirable from the point of view of the regulatory function. We agree that tests should be made to determine over what range of UWB characteristics such an equivalence can be found, and what the relations are in detail for different UWB systems.

We do not agree that one simulator created by a testing institution can be assumed to represent all UWB systems.

We agree that it will be necessary to establish tests which can be carried out under controlled conditions, rather than attempt to relate the approval procedure to the actual susceptibilities and the actual conditions of operation of selected contemporary systems.

We agree that tolerable interference levels should be related to the "self-interference" constituted by Johnson noise in any system.

We do not agree with the argument that the RFI permitted for MSS MET occupies all margin of safety and therefore excludes any other system. It should be noted that this level is 2dB below the level of Johnson noise in the victim receiver, and probably 6dB or more below actual thermal noise, and will be occasional. This may be a reasonable definition of the maximum level of interference from a threat system which should be considered insignificant by comparison with noise which is always present; however, two uncorrelated (and probably non-coincident) insignificant sources should not then be taken to constitute a significant or harmful one.

Mrs Magalie Roman Salas
Commission's Secretary
Federal Communications Commission

Some of the quoted expressions of concern extrapolate the use of worst-case conditions (used to assess the effect of one additional emitter) to assume that worst-case conditions are similarly likely to apply simultaneously to many. The presence of both a MSS MET transceiver and a UWB device within 100 ft. beneath the final approach of an aircraft is quite possible, but even less likely than the presence of either one, and in both cases will fall below the receiver's own noise floor.

We have the following further comment:

In relation to the levels of emission to be permitted, as described in the NPRM, we wish to comment that the formula for adjustment of absolute peak power may be found to be somewhat more restrictive than is necessary to guarantee acceptable UWB operations, while making some desirable functions marginally unattainable. We would recommend that the limit should apply to the rms value over a highest-amplitude waveform period, rather than to a single absolute peak value, which could be subject to a single-sample error.